Section 5

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Mercer County had a strong pre-disaster economy and an unemployment rate less than the State average. Hurricane Floyd flood-induced damage in Mercer County was localized. Although there were reports of some business damage in Lawrence, Ewing, and Princeton Townships, most of the business damage in the county occurred in the City of Trenton.

Local residents estimated that 21 businesses suffered damage in Trenton as a result of the flooding. The city suffered less than a 1 percent reduction or loss in annual revenue, annual payroll, and real property value as a direct result of flooding. This is considered an insignificant impact to Trenton's overall economy.

The City of Trenton should consider frequently flooded businesses as candidates for relocation to other sites in the city.

5.1 Pre-Disaster Conditions

5.1.1 Primary Industries and Employment

Mercer County's pre-disaster economy, including the city of Trenton, can be characterized as healthy, based upon available employment and income data. Average 1998 unemployment for the county was 4.1 percent, which is less than the State's 4.6 percent figure. However, Trenton's unemployment rate was 8.8 percent. Mercer County's 1997 per capita income was $36,598.

The City of Trenton lies within Mercer County and serves as the State capital and county seat. Trenton has an estimated labor force of 39,700.

Mercer County's primary industries are in the service sector, based upon the number of employed individuals (see Table 5-1). Forty-four percent of the county's jobs are in the service sector. Manufacturing and retail trade account for 18 percent and 16 percent, respectively. From 1996 to 2006, employment in the service sector is expected to increase substantially at an annual rate of 2.4 percent. Employment in manufacturing and public sectors is expected to decrease at an annual rate of 1.8 percent and 0.2 percent, respectively.

Table 5-1 Primary Industries in Mercer County (1996)

Industry Sector	Number of Establishments	Number Employed
Agriculture, Forestry, and Fishing	171	825
Mining	2	< 20
Construction	710	4,149
Manufacturing	413	28,530
Transportation & Public Utilities	290	7,098
Wholesale Trade	544	7,845
Retail Trade	2,108	25,605
FIRE	968	12,451
Services	3,848	68,678
Unclassified	24	< 20
Total	9,078	155,206

Source: U.S. Bureau of the Census

In 1996, businesses in the City of Trenton employed 88,970 people. The annual payroll, as reported by the U.S. Census Bureau, was $4.26 billion for the 5,611 businesses located in the city in 1996. Annual revenue for businesses in Trenton in 1992 was $932 million for the 895 businesses evaluated (including only the services, wholesale trade, and retail trade sectors). The City of Trenton's largest employers are listed in Table 5-2. Commercial and industrial property values were determined from assessed values for a total business property market value of $462 million.

Table 5-2 Major Businesses in Trenton

Major Employers	Industry Sector	Number Employed
Capital Health Systems Inc.	Services	1320
Mercer Medical Center, Inc.	Services	1280
Saint Francis Medical Center, Inc.	Services	1050
New Jersey Department of Human Services	Services	800
The Times of Trenton Publishing Corp.	Services	722
Shop Rite	Retail Trade	800
New Jersey Department of Corrections	Services	674

Source: Dun and Bradstreet, October 1999

5.1.2 Historic Flooding and Past Studies

Trenton lies in the central western portion of New Jersey along the Delaware River. The city is located in an extensively developed area with most of its commercial and industrial areas either paralleling Assunpink Creek through the center of the city or along the Delaware River, which forms the city's western boundary. As a result of Trenton's geography, flooding problems are primarily centered along Assunpink Creek or the Delaware River. Assunpink Creek is susceptible to flooding during any season from thunderstorms or long duration rainfalls. Flooding problems are exacerbated by heavy urban/industrial development, inadequate drainage design, road and railroad crossings, and development in or along the floodway. Flooding along the Delaware River is generally associated with late winter or early spring snowmelts and ice jams.

Flood damage along the Assunpink Creek occurs frequently. According to an NJOEM report on the Mulberry Street Flood disaster on January 28, 1994, and the Flood of 1996, at least $5 million in flood

damages occurred over a period of 5 years. The flood of record along the Delaware River was registered by Hurricane Diane on August 20, 1955. This storm had a return period of approximately 200 years, or in other terms, there is approximately a 0.5 percent chance that a Hurricane Diane magnitude flood could recur in any one year. Other floods of significance along the Delaware River include a 110-year event on October 11, 1903, and a 30-year event on March 19, 1936.

A number of government agencies have extensively studied the City of Trenton's flooding problems. The New York District of USACE and the Delaware River Basin Commission have studied the Delaware River and frequently suggested alternatives, including large dams in the upper reaches of the basin. A number of flood control dams were constructed on Delaware River tributaries from the late 1950's to the mid-1970's, but a main stem dam at Tock's Island was not constructed due to environmental impacts and public opposition. Nonstructural flood protection measures along the Delaware River were also examined by the USACE. Additionally, the Natural Resource Conservation Service (NRCS) developed the Assunpink Watershed Project in 1964.

To reduce the susceptibility of the city to disaster damages, Trenton has become a Project Impact Community and has dedicated itself to forming private/public partnerships to reduce its vulnerability to disasters. To pursue this strategy, Trenton established a flood mitigation subcommittee, which identified and evaluated areas most vulnerable to flooding. The subcommittee issued a report on December 4, 1998 outlining mitigation measures that could be undertaken to reduce hazards. One mitigation measure involved an area on the Assunpink Creek near the intersection of Mulberry and Clinton Streets. City officials indicated that the severity of flooding in this location was due to bottlenecks along the Assunpink that were largely caused by a number of low bridges that trapped debris. The city looked into replacing these bridges but decided such a project would be prohibitively expensive. Instead, the city opted to acquire a number of business and residential properties in conjunction with Project Impact. EDA awarded the city a $40,000 grant in 1999 to perform a flood control study of the Assunpink Creek. This engineering study will address how to best clear obstructions from the creek to relieve flooding.

5.2 Post-Disaster Conditions

Although there were reports of some business damage in Lawrence, Ewing, and Princeton Townships, most business damage in Mercer County reportedly occurred in the City of Trenton.

Only 51 businesses in Mercer County teleregistered with FEMA as of November 1, 1999. As of January 13, 2000, five businesses in Mercer County were approved for physical loans with SBA. The value of these loans was $1.4 million. SBA approved two economic injury loans for a total of $114,000.

Flooding that occurred on September 16, 1999 was particularly severe along the Assunpink Creek, which runs through the middle of Trenton into the Delaware River. Assunpink Creek exceeded a 100-year recurrence frequency and fell just 0.69 feet short of the peak record at the Assunpink Creek gage. The Delaware River crested at a relatively low-flood peak, registering as approximately a 4-year frequency event.

Flood impacts on businesses were largely restricted to three localized areas along the Assunpink. The first area encompassed the intersection of Mulberry and Clinton Streets. Floodwaters severely damaged an auto parts business, an industrial park, and a machining shop. The acquisition process described in the preceding section was underway when Hurricane Floyd occurred.

Floodwaters also severely affected the intersection of Taylor Street and North Olden Avenue. A warehousing operation and a manufacturing facility suffered significant damage. Business owners at this location indicated that flooding was not caused by the Assunpink overflowing its banks but by obstructions created in streams draining into the creek.

Minor damage was reported in a third area at the intersection of Ferry and Bridge Streets. In this case, water spilled off the Amtrak rail bed and collected in a depression. Water did not reach great elevations and one wholesaling/service operation suffered minor damage.

Local officials estimated that 21 businesses in Trenton suffered damage as a result of flooding. The city's largest employers, listed in Section 5.1.1, were not directly affected. Businesses affected were in the retail and wholesale trade, manufacturing, transportation/utilities, and service sectors, and were relatively small, ranging from 1 to 25 employees. Only 3 of the 12 firms surveyed had more than 10 employees.

Surveys were conducted on 12 (57 percent) of the affected businesses in Trenton. It is estimated that all of the businesses that sustained damage were located in the 100-year floodplain. Information from the city indicates that those firms not interviewed suffered only minor damage; therefore, estimates for the population of damaged businesses cannot be directly extrapolated from the sampled businesses.

Many businesses interviewed were renters in search of new locations. One of the most significant concerns business owners expressed was the repeated nature of flooding in the area and the perception that the flooding has become progressively worse.

5.2.1 Revenues Lost

Total lost revenue reported by all respondents was approximately $870,000. If the implied loss rate is applied to the other businesses impacted, a conservative estimate of total lost revenue would total about $1 million. This figure represents expected revenue losses to date. Since many of the firms were not certain when they would reopen (some indicated 3 months to 6 months), this figure could be much greater. Since many businesses were waiting to be relocated and did not know when they would be able to reopen, it was impossible to forecast additional lost revenue. Nevertheless, if these businesses are not operating at full capacity by early 2000, the figure given above for lost revenue could easily be doubled.

In addition, the reconnaissance team was unable to measure the economic effect related to the closure of the rail lines into and out of Trenton for 2 days following the storm. This closure was certainly an inconvenience for businesses and commuters and potentially had an impact on the greater regional and state economies.

5.2.2 Annual Taxes Lost

There may be a slight reduction in property taxes associated with reappraisals of commercial property affected by Hurricane Floyd. The amount of this reduction would be based upon appraised values of specific properties and was therefore impossible to estimate at the time of the survey.

5.2.3 Numbers of Employees

Of the business owners interviewed, 3 reported employment of more than 10 employees. None of the flood-impacted firms reduced its workforce, although work was shifted from production to cleanup for a number of weeks. A firm that had just undergone a major refit reported that due to the flooding it will be unable to hire an additional 10 or so workers until it was able to resume operations. Assuming this firm will not reopen for another 6 months and a State average hourly wage of $11.40 for the sector, total wages lost due to the flood would be $104,000.

5.2.4 Structural Property Damage

Five respondents provided cost estimates to repair structural damage to their facilities. Nonstructural items such as lights and ceilings, contents (computers, desks, tables, chairs), or inventory were not included. The total combined estimate of the five respondents was $930,000. Owners/managers of the seven businesses renting their space could not estimate the cost of structural repairs since their landlords were responsible. A conservative estimate would place total structural damages at about $1.5 million for all the businesses affected.

5.2.5 Nonstructural Property and Equipment Damage

Twelve respondents estimated the cost to repair nonstructural damages at just over $2 million. Most of this cost was the result of equipment damages - particularly to electrical machinery. Several respondents indicated that the true cost of equipment damage might not be known for some time since it still remains to be seen whether equipment will work properly and for how long. Considering those businesses not interviewed, a conservative estimate would place total nonstructural property and equipment damages at about $2.5 million for all the businesses affected.

5.2.6 Inventory Damage

In some cases, damage to inventory was minimal. Five business owners reported no damage at all to inventory - either because they were able to move inventory or the nature of the inventory was such that it could

be cleaned and salvaged. On the other hand, one warehouse alone reported damage of about $3 million in inventory.

A total of seven firms reported an estimated $3.2 million in lost or damaged inventory. Considering those businesses not interviewed, a conservative estimate would place total inventory damages at about $4 million for all the businesses affected.

5.2.7 Utility-Related Losses

No utility companies discontinued service to their customers in Trenton as a result of Hurricane Floyd. Nonetheless, several businesses suffered a loss of electrical power and telephone service. Wiring in several businesses at the Clinton Commerce Center shorted out as a result of prolonged flooding. When the surveys were conducted, approximately 3 weeks after the storm, electrical service had not yet been restored to four of the businesses interviewed. The slow return of electrical service to these businesses was due to a lack of action on behalf of the landlord, who is legally responsible for repairs. This was the principal reason why many businesses surveyed in Trenton were not yet operating 2 weeks after the interviews and why some were considering relocation.

Train service through Trenton along the northeast corridor (Amtrak, Conrail, New Jersey Transit, and Southeastern Pennsylvania Transportation Authority) was interrupted for 2 days due to extensive flooding from the Assunpink Creek at the Trenton station. Business in Trenton, as well as elsewhere in New Jersey and along the east coast, was affected by the forced changes in commuting and freight shipment patterns.

5.2.8 Business Reopenings

Within 1 month of the flood event, only one business owner/manager interviewed had reopened his business. Five others were partly operational, but all of these were hoping to relocate in the near future. Firms reporting partial operations ranged from 10 percent to 65 percent capacity. Six businesses in the industrial park remained closed and probably will not reopen until relocated.

5.2.9 Rebuilding or Relocation

Only one business interviewed had reopened and planned to operate onsite permanently. One business closed permanently and another had

already found facilities in a different municipality. The remaining nine businesses surveyed are working with the City of Trenton to find new locations within the city.

5.2.10 Category and Value of Economic Loss

Table 5-3 summarizes the economic effects of flooding in Trenton. When jobs are lost as a result of a disaster (opposed to a strategic move to consolidate positions or locations), staff layoffs typically result in lost revenue. Therefore, payroll losses are embedded in estimates for lost revenue and adding payroll losses to revenue losses would be double-counting the former. This does not trivialize the significance of the loss of these jobs to the employers or to the workers themselves. Indeed, the loss of jobs to any residents of flooded communities make the business community's full recovery that much more difficult.

Table 5-3 Summary of Economic Losses – City of Trenton

Category of Economic Loss	Value of Loss [$]
Revenue Losses	1,000,000
Payroll Losses	*104,000*
Structural Property Damage	1,500,000
Nonstructural Property & Equipment Damage	2,500,000
Inventory Damage	4,000,000
Total (excluding Payroll Losses)*	9,000,000

* Total was rounded to two significant digits.

5.3 Conclusions

Direct revenue losses were no more than 0.1 percent of annual revenues for Trenton's businesses. Direct payroll losses were less than 0.1 percent of annual payroll for the businesses in the city.* Structural property damage was approximately 0.5 percent of real property values

* Annual revenue and annual payroll were based on 1992 and 1996 data, respectively. Although these figures were adjusted to 1999 dollars, they do not account for any economic growth that may have occurred in the community between the time the data was recorded and 1999. Therefore, compared to annual revenue and annual payroll, the actual percentages are expected to be less than reported. In addition, annual revenue was based on only three industry sectors (services, retail trade, and wholesale trade); the percentage of annual revenue lost to the disaster was therefore less than estimated.

of businesses in Trenton. These direct losses are considered a negligible impact to Trenton's business community.

Total extent of the damage is modest compared to the size of the local economy. Nevertheless, damages to some individual businesses were substantial. Twenty-one businesses suffered damages; a majority of these businesses were in the retail and wholesale trade, manufacturing, transportation/utilities, and service sectors. Only one business had reopened within a month of the flood, five others were partially operational, and six will probably not reopen until they relocate. The city has a relatively high unemployment rate and does not wish to lose any source of employment; therefore, it is seeking to relocate these businesses within the city. At the time of the survey, city government and business owners were in discussion to relocate business establishments, although no formal plan for business relocation existed. Ultimately, the long-term impact of the September 16, 1999 flooding on the business economy, including any potential job loss, should be minimal. Nevertheless, recommendations listed in the following section should serve to strengthen the city's economy.

5.4 Recommendations

(a) **Create disaster-resistant redevelopment areas for relocation of frequently flooded businesses.** As a mature industrial center, Trenton has a supply of vacant manufacturing properties that could provide much needed space to smaller firms, especially those wishing to move from floodprone areas. The city should acquire properties frequently damaged by floods and relocate resident businesses. For example, the city should work with New Jersey Transit to release unused freight yard property to the city for economic development purposes. This property could be used to allow businesses to relocate outside the floodplain. Additionally, Trenton is undergoing redevelopment of some areas outside the floodplain and these might be appropriate relocation options for businesses damaged by floods. To purchase abandoned industrial properties (such as the Lennox facility) and redevelop them to serve as locations for smaller industrial firms, the City of Trenton should seek funding from Federal and State agencies that fund mitigation activities such as buyouts, relocation, and long-term recovery and serve to stimulate private investment by assembling and preparing real estate for key development projects.

(b) **Choose relocation or floodproofing over large structural mitigation projects.** Since flood damage in Trenton was

somewhat localized and affected relatively few businesses, the city should consider investing in business relocations or floodproofing rather than large costly structural mitigation projects. Structural and nonstructural flood control is discussed in Section 3.4.1 (b). This course of action is already the focus of Trenton's Project Impact strategy. Two factors bolster this recommendation: the relative abundance of vacant, industrial-zoned land and the relatively poor fiscal reserves in the city's budget. Relocation assistance for businesses located in areas of repeated flooding should include site selection and grants or loans for moving expenses and structural enhancements.

(c) **Encourage floodproofing.** The City of Trenton should also encourage businesses adjacent to flooding sources and affected by flooding to floodproof their structures, as described in Section 3.4.1 (b). Many facilities have taken some precautionary measures to make their businesses watertight. However, in some cases, their efforts were minimally successful in reducing flood impacts. More thorough and systematic floodproofing could prevent repetitive losses to building contents in the future.

(d) **Protect businesses that rent their property.** The inability of many firms in Trenton to recover quickly from Hurricane Floyd flooding was the direct result of a lack of information and expedient post-disaster actions by property managers. Several tenants in one industrial park were unaware that the park was located in a floodplain and therefore had no flood insurance to cover inventory and equipment or business disruption insurance for lost revenue. The city should implement measures similar to those described in Section 3.4.2 (b) to protect businesses that rent their property.

(e) **Remove obstructions from Assunpink Creek.** Using the results from the EDA-funded study described in Section 5.1.2, the City of Trenton should remove obstructions from Assunpink Creek. Funding sources could include programs that implement cost-effective, environmentally sound, long-term mitigation measures which substantially reduce the risk of future damage and loss of life for major disasters.